AMENDMENTS TO THE CLAIMS:

Please amend claims 1-4 and 7-10, and add new claims 13-18 as listed in the following listing of the claims, which replaces all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method of estimating power consumption and noise levels of an integrated circuit which is composed of logic gates connected in the form of a plurality of stages, comprising the steps of:

calculating a first set of output signal elementary waveforms and occurrence probabilities thereof at the first stage of the logic gates by the use of signal waveforms and occurrence probabilities thereof at primary input terminals of the integrated circuit ~~(hereafter called the primary input terminals)~~;

calculating a second set of output signal elementary waveforms and occurrence probabilities thereof at the second stage of the logic gates by the use of said ~~output~~ signal waveforms and said occurrence probabilities ~~probability~~ thereof at said primary input terminals and said first set of output signal elementary waveforms and said occurrence probabilities ~~probability~~ thereof at the first stage of the logic gates; and in the same manner

calculating an n-th set (n is a natural number) of output signal elementary waveforms and occurrence probabilities thereof at the n-th stage ~~(n is a natural number)~~

of the logic gates by the use of said ~~output~~ signal waveforms and said occurrence probabilities ~~probability~~ thereof at said primary input terminals and ~~said~~ an (n-1)th set of output signal elementary waveforms and ~~said~~ occurrence probabilities ~~probability~~ thereof at the (n-1)th stage of the logic gates,

estimating power consumption and noise levels based on at least the n sets of output signal elementary waveforms and occurrence probabilities thereof,

wherein types of the respective elementary waveforms, occurrence probabilities and signal correlations are calculated relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period.

2. (Currently Amended) The method of estimating power consumption and noise levels of an integrated circuit as claimed in claim 1 wherein calculating occurrence probabilities further comprises calculating ~~the~~ a probability $P(W_A \wedge W_B)$ of the combination of an elementary waveform W_A at one input terminal and an elementary waveform W_B at another input terminal, according to a formula: ~~are calculated by the use of~~

$$P(W_A \wedge W_B)$$

$$= P(W_A)\ P(W_B) + \sum_{i=1}^{n} \sum_{\alpha<\beta} P(w_i^\alpha)\ P(w_i^\beta)\ (P(W_A|w_i^\alpha) - P(W_A|w_i^\beta))\ (P(W_B|w_i^\alpha) - P(W_B|w_i^\beta))$$

where w_i^α designates the α-th elementary waveform of the i-th primary input;

n designates the number of the primary inputs; and ~~mi designates the number of the elementary waveforms of the i-th primary input;~~

$P(W_A|w_i^\alpha)$ is the conditional probability of the elementary waveform W_A under the condition that the α-th elementary waveform occurs at the i-th primary input terminal.

3. (Currently Amended) The method of estimating power consumption and noise levels of an integrated circuit as claimed in claim 2 further comprising:

a step of assigning $P(W_A) * P(W_B)$ to $P(W_A \wedge W_B)$;

a step of setting the initial values of i and α ~~respectively~~ to 1 and β to $\alpha + 1$;

a step of incrementing $P(W_A \wedge W_B)$ by

$$P(w_i^\alpha)P(w_i^\beta)\left(P(W_A \mid w_i^\alpha) - P(W_A \mid w_i^\beta)\right)\left(P(W_B \mid w_i^\alpha) - P(W_B \mid w_i^\beta)\right)$$

a first loop in which $P(W_A \wedge W_B)$ is incremented by

$$P(w_i^\alpha)P(w_i^\beta)\left(P(W_A \mid w_i^\alpha) - P(W_A \mid w_i^\beta)\right)\left(P(W_B \mid w_i^\alpha) - P(W_B \mid w_i^\beta)\right)$$

anew each time β is incremented by 1 in steps from $\alpha + 1$ to the number of types of the elementary waveforms of said another input terminal;

a second loop in which, each time β reaches the number of types of the elementary waveforms of said another input terminal, α is incremented by 1 followed by returning to said first loop, said second loop being repeated until α reaches to the number of types of the elementary waveforms of said one input terminal; and

a third loop in which, each time α reaches to the number of types of the elementary waveforms of said one input terminal, i is incremented by 1 followed by

returning to said second loop, said third loop being repeated until i reaches to the number of the primary input terminals.

4. (Currently Amended) The method of estimating power consumption and noise levels of an integrated circuit as claimed in claim 1 wherein said predetermined time period is divided into a plurality of time blocks; and wherein, if elementary waveforms have the same pattern of signal transitions as considered only at the boundary between each of adjacent time blocks, such elementary waveforms are recognized as the same elementary waveform even in the case that there is a difference therebetween inside of a time block.

5. (Original) The method of estimating power consumption and noise levels of an integrated circuit as claimed in claim 1 wherein, in the step of calculating the types of the respective elementary waveforms, the occurrence probabilities and the signal correlations relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period, the occurrence probabilities of the signal waveforms are calculated without taking into consideration those of said signal waveforms whose said occurrence probabilities are no higher than a predetermined value.

6. (Original) The method of estimating power consumption and noise levels of an integrated circuit as claimed in claim 4 wherein, in the step of calculating the types of the respective elementary waveforms, the occurrence probabilities and the signal

correlations relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period, the occurrence probabilities of the signal waveforms are calculated without taking into consideration those of said signal waveforms whose said occurrence probabilities are no higher than a predetermined value.

7. (Currently Amended) A computer-readable recording medium storing a program for estimating power consumption and noise levels of an integrated circuit which is composed of logic gates connected in the form of a plurality of stages, comprising the steps of:

calculating a first set of output signal elementary waveforms and occurrence probabilities thereof at the first stage of the logic gates by the use of signal waveforms and occurrence probabilities thereof at primary input terminals of the integrated circuit ~~(hereafter called the primary input terminals)~~;

calculating a second set of output signal elementary waveforms and occurrence probabilities thereof at the second stage of the logic gates by the use of said ~~output~~ signal waveforms and said occurrence probabilities ~~probability~~ thereof at said primary input terminals and said first set of output signal elementary waveforms and said occurrence probabilities ~~probability~~ thereof at the first stage of the logic gates; and in the same manner

calculating an n-th set (n is a natural number) of output signal elementary waveforms and occurrence probabilities thereof at the n-th stage ~~(n is a natural number)~~ of the logic gates by the use of said ~~output~~ signal waveforms and said occurrence

probabilities ~~probability~~ thereof at said primary input terminals and ~~said~~ an (n-1)th set of output signal elementary waveforms and ~~said~~ occurrence probabilities ~~probability~~ thereof at the (n-1)th stage of the logic gates,

estimating power consumption and noise levels based on at least the n sets of output signal elementary waveforms and occurrence probabilities thereof,

wherein types of the respective elementary waveforms, occurrence probabilities and signal correlations are calculated relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period.

8. (Currently Amended) The computer-readable recording medium storing the program for estimating power consumption and noise levels of an integrated circuit as claimed in claim 7 wherein calculating occurrence probabilities further comprises calculating a ~~the~~ probability $P\ (W_A \wedge W_B)$ of the combination of an elementary waveform W_A at one input terminal and an elementary waveform W_B at another input terminal, according to a formula: ~~are calculated by the use of~~

$$P\ (W_A \wedge W_B)$$

$$= P\ (W_A)\ P\ (W_B) + \sum_{i=1}^{n} \sum_{\alpha<\beta} P\ (w_i^\alpha)\ P\ (w_i^\beta)\ (P\ (W_A|w_i^\alpha) - P\ (W_A|w_i^\beta))\ (P\ (W_B|w_i^\alpha) - P\ (W_B|w_i^\beta))$$

where w_i^α designates the α-th elementary waveform of the i-th primary input; and n designates the number of the primary inputs; ~~and mi designates the number of the elementary waveforms of the i-th primary input;~~

$P(W_A|w_i^\alpha)$ is the conditional probability of the elementary waveform W_A under the condition that the α-th elementary waveform occurs at the i-th primary input terminal.

9. (Currently Amended) The computer-readable recording medium storing the program for estimating power consumption and noise levels of an integrated circuit as claimed in claim 8 further comprising:

a step of assigning $P(W_A) * P(W_B)$ to $P(W_A \wedge W_B)$;

a step of setting the initial values of i and α ~~respectively~~ to 1 and β to $\alpha + 1$;

a step of incrementing $P(W_A \wedge W_B)$ by

$$P(w_i^\alpha)P(w_i^\beta)\left(P(W_A \mid w_i^\alpha) - P(W_A \mid w_i^\beta)\right)\left(P(W_B \mid w_i^\alpha) - P(W_B \mid w_i^\beta)\right)$$

a first loop in which $P(W_A \wedge W_B)$ is incremented by

$$P(w_i^\alpha)P(w_i^\beta)\left(P(W_A \mid w_i^\alpha) - P(W_A \mid w_i^\beta)\right)\left(P(W_B \mid w_i^\alpha) - P(W_B \mid w_i^\beta)\right)$$

anew each time β is incremented by 1 in steps from $\alpha + 1$ to the number of types of the elementary waveforms of said another input terminal;

a second loop in which, each time β reaches the number of types of the elementary waveforms of said another input terminal, α is incremented by 1 followed by returning to said first loop, said second loop being repeated until α reaches to the number of types of the elementary waveforms of said one input terminal; and

a third loop in which, each time α reaches to the number of types of the elementary waveforms of said one input terminal, i is incremented by 1 followed by returning to said second loop, said third loop being repeated until i reaches to the number of the primary input terminals.

10. (Currently Amended) The computer-readable recording medium storing the program for estimating power consumption and noise levels of an integrated circuit as claimed in claim 7 wherein said predetermined time period is divided into a plurality of time blocks; and wherein, if elementary waveforms have the same pattern of signal transitions as considered only at the boundary between each of adjacent time blocks, such elementary waveforms are recognized as the same elementary waveform even in the case that there is a difference therebetween inside of a time block.

11. (Original) The computer-readable recording medium storing the program for estimating power consumption and noise levels of an integrated circuit as claimed in claim 7 wherein, in the step of calculating the types of the respective elementary waveforms, the occurrence probabilities and the signal correlations relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period, the occurrence probabilities of the signal waveforms are calculated without taking into consideration those of said signal waveforms whose said occurrence probabilities are no higher than a predetermined value.

12. (Original) The computer-readable recording medium storing the program for estimating power consumption and noise levels of an integrated circuit as claimed in claim 10 wherein, in the step of calculating the types of the respective elementary waveforms, the occurrence probabilities and the signal correlations relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within

a predetermined time period, the occurrence probabilities of the signal waveforms are calculated without taking into consideration those of said signal waveforms whose said occurrence probabilities are no higher than a predetermined value.

13. (New) A computer program product for estimating power consumption and noise levels of an integrated circuit which is composed of logic gates, the computer program product comprising:

instructions for calculating a first set of output signal elementary waveforms and occurrence probabilities thereof at a first stage of the logic gates by the use of signal waveforms and occurrence probabilities thereof at primary input terminals of the integrated circuit;

instructions for calculating a second set of output signal elementary waveforms and occurrence probabilities thereof at a second stage of the logic gates by the use of said signal waveforms and said occurrence probabilities thereof at said primary input terminals and said first set of output signal elementary waveforms and said occurrence probabilities thereof at the first stage of the logic gates; and in the same manner

instructions for calculating an n-th set (n is a natural number) of output signal elementary waveforms and occurrence probabilities thereof at an n-th stage of the logic gates by the use of said signal waveforms and said occurrence probabilities thereof at said primary input terminals and an (n-1)th set of output signal elementary waveforms and occurrence probabilities thereof at an (n-1)th stage of the logic gates,

instructions for estimating power consumption and noise levels based on at least the n sets of output signal elementary waveforms and occurrence probabilities thereof,

wherein types of the respective elementary waveforms, occurrence probabilities and signal correlations are calculated relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period.

14. (New) The computer program product of claim 13 wherein calculating occurrence probabilities further comprises calculating

a probability $P(W_A \wedge W_B)$ of the combination of an elementary waveform W_A at one input terminal and an elementary waveform W_B at another input terminal, according to a formula:

$$P(W_A \wedge W_B)$$

$$= P(W_A)\ P(W_B) + \sum_{i=1}^{n} \sum_{\alpha<\beta} P(w_i^\alpha)\ P(w_i^\beta)\ (P(W_A|w_i^\alpha) - P(W_A|w_i^\beta))\ (P(W_B|w_i^\alpha) - P(W_B|w_i^\beta))$$

where w_i^α designates the α-th elementary waveform of the i-th primary input; and n designates the number of the primary inputs; and

$P(W_A|w_i^\alpha)$ is the conditional probability of the elementary waveform W_A under the condition that the α-th elementary waveform occurs at the i-th primary input terminal.

15. (New) The computer program product of claim 14 wherein calculating occurrence probabilities further comprises:

instructions for assigning $P(W_A) * P(W_B)$ to $P(W_A \wedge W_B)$;

instructions for setting the initial values of i and α respectively to 1 and β to $\alpha + 1$;

instructions for incrementing $P(W_A \wedge W_B)$ by

$$P(w_i^{\alpha})P(w_i^{\beta})\left(P(W_A \mid w_i^{\alpha}) - P(W_A \mid w_i^{\beta})\right)\left(P(W_B \mid w_i^{\alpha}) - P(W_B \mid w_i^{\beta})\right)$$

a first loop in which $P(W_A \wedge W_B)$ is incremented by

$$P(w_i^{\alpha})P(w_i^{\beta})\left(P(W_A \mid w_i^{\alpha}) - P(W_A \mid w_i^{\beta})\right)\left(P(W_B \mid w_i^{\alpha}) - P(W_B \mid w_i^{\beta})\right)$$

anew each time β is incremented by 1 in steps from $\alpha + 1$ to the number of types of the elementary waveforms of said another input terminal;

a second loop in which, each time β reaches the number of types of the elementary waveforms of said another input terminal, α is incremented by 1 followed by returning to said first loop, said second loop being repeated until α reaches to the number of types of the elementary waveforms of said one input terminal; and

a third loop in which, each time α reaches to the number of types of the elementary waveforms of said one input terminal, i is incremented by 1 followed by returning to said second loop, said third loop being repeated until i reaches to the number of the primary input terminals.

16. (New) The computer program product of claim 13 wherein said predetermined time period is divided into a plurality of time blocks; and wherein, if elementary waveforms have the same pattern of signal transitions as considered only at the boundary between each adjacent time blocks, such elementary waveforms are recognized as the same elementary waveform even in the case that there is a difference therebetween inside of a time block.

17. (New) The computer program product of claim 13 wherein, in calculating the types of the respective elementary waveforms, the occurrence probabilities and the signal correlations relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period, the occurrence probabilities of the signal waveforms are calculated without taking into consideration those of said signal waveforms whose said occurrence probabilities are no higher than a predetermined value.

18. (New) The computer program product of claim 16 wherein, in calculating the types of the respective elementary waveforms, the occurrence probabilities and the signal correlations relating to signals located on each wiring of each stage inside of the integrated circuit and occurring within a predetermined time period, the occurrence probabilities of the signal waveforms are calculated without taking into consideration those of said signal waveforms whose said occurrence probabilities are no higher than a predetermined value.